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Week 4: Firm Site Selection and Industrial land Use.

- Households as a factor of production versus as a client.

- Historic cities – commerce and industry at the Center.

- Changes in Technology and Transportation.

- Modern Industrial location.

Firm – Household Linkages

- Firms sell products to workers - the friction is "shopping" or client visit transportation costs: Retail stores, "retail" services [insurance dealers, barber shops, retail brokerage offices…]

- Firms sell products nationally and employ workers as a factor of production – the friction is the commuting of workers

Sources of Spatial data on Firms and employment

- Firms (IRS, SEC) versus Establishments (BLS, Census). SIC codes

- Federal Establishment files (8 million)

- State surveys (monthly, quarterly, annual)

- Recent release of detailed data by Zip code – "a revolution" [http://www.census.gov/epcd/www/zipstats.html.]

Employment dispersal in Dallas CMSA

(see: Shukla and Waddell, RSUE, 1991)
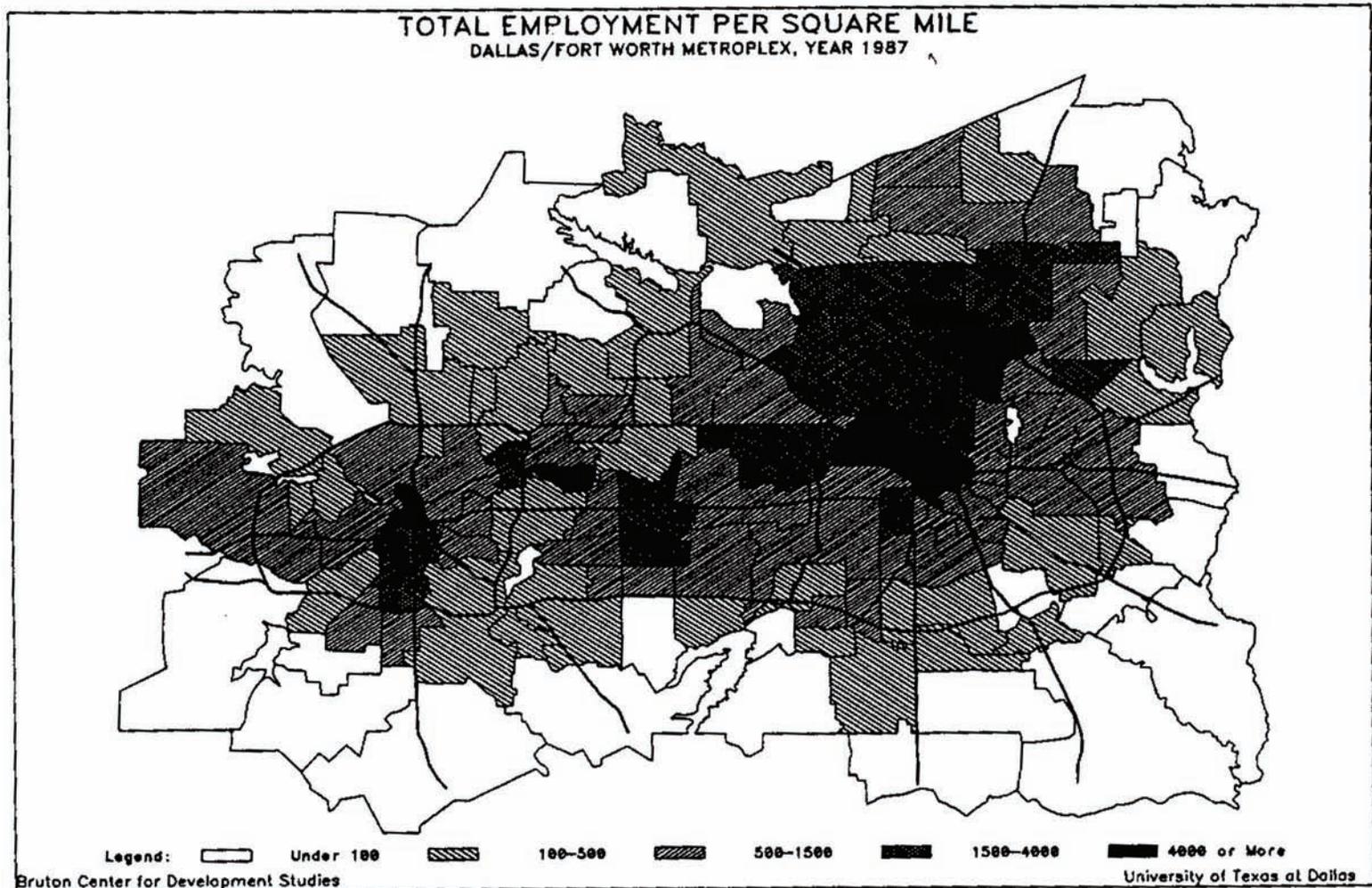
Fig. 1 (a)

Courtesy of Elsevier Science BV, from *Regional Science and Urban Economics*. Used with permission.

Employment decentralization in Boston

Employment Category	Boston, City				Boston, Suburbs			
	1970	**1980**	**1990**	**2000**	**1970**	**1980**	**1990**	**2000**
Private Non-Agricultural	496,548	492,095	539,720	613,385	1,046,936	1,334,948	1,648,863	1,888,350
Mining	180	129	267	(D)	682	1,187	1,513	(D)
Construction	23,159	12,589	14,967	20,803	64,156	59,336	87,537	112,173
Manufacturing	68,078	55,830	34,603	30,071	316,318	367,345	303,883	247,888
Transportation and public utilities	45,458	39,890	38,187	40,911	45,581	55,618	64,333	75,222
Wholesale trade	45,170	31,622	21,706	19,106	56,164	83,974	111,097	116,793
Retail trade	87,315	65,420	67,507	72,227	214,694	263,779	312,328	331,863
Finance, insurance, and real estate	76,743	76,991	94,534	108,413	60,812	97,491	130,903	157,846
Services	150,445	209,624	267,949	321,854	288,529	406,218	637,269	845,450

Monocentric City: The Historic Central Business District

(Location = rent competition between uses)
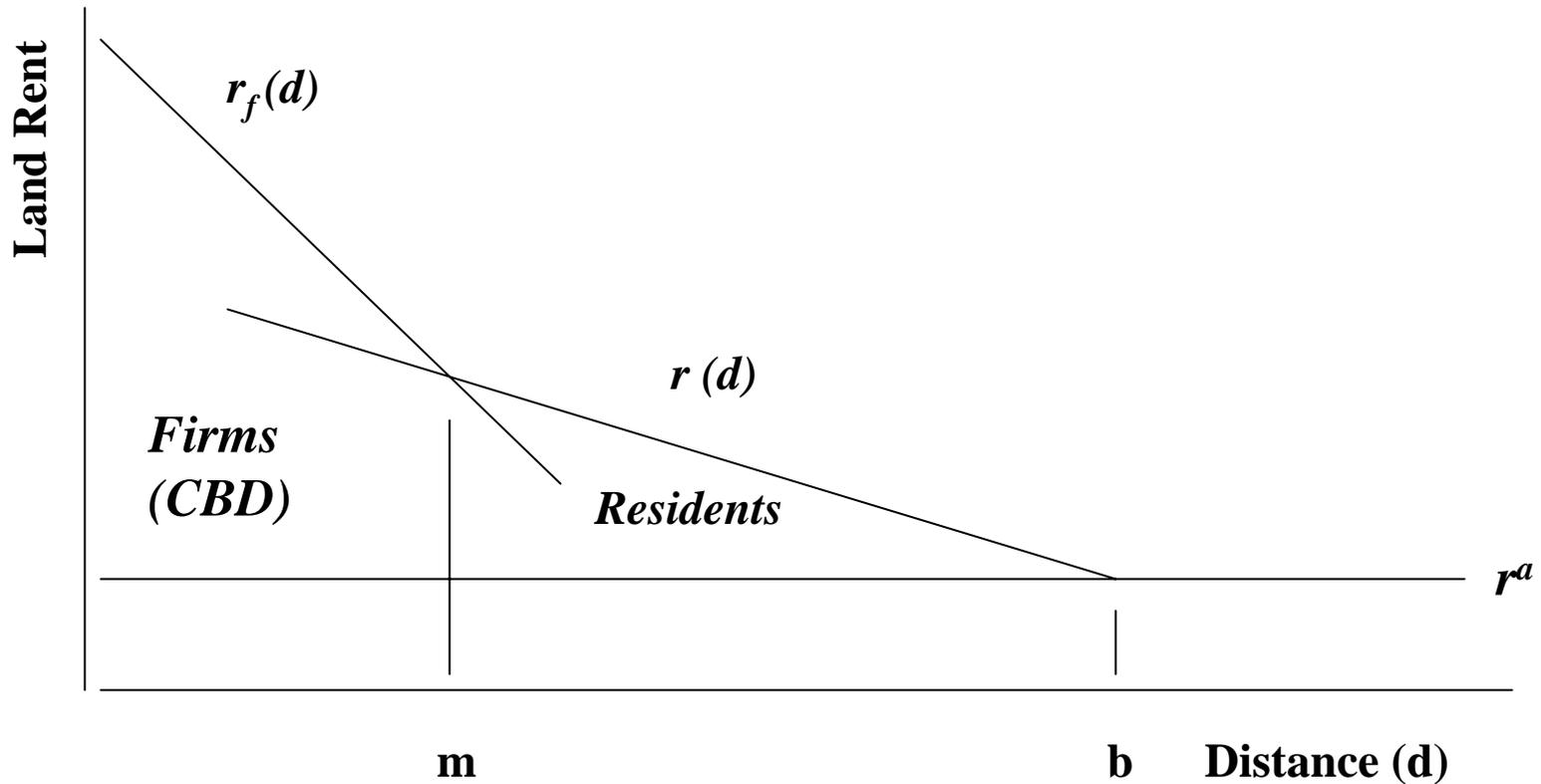
1). Profit/unit output (π)

$\pi = [S - AC - sd] - r_f(d)/Q$

S = sale price/unit

AC = average cost (inc. capital)

s = shipping cost to port

d = distance to port

$r_f(d)$ = firm rent per acre

Q = units of output per acre

In equilibrium profits must be fixed across locations.

2). Rent that yields Equal profit.

$$r_f(d) = [S - AC - sd - \pi] * Q$$

3). Slope of firm rent function:

$$\partial r_f / \partial d = -s * Q$$

4). Historic changes in s, Q.

- From carts to water to rail to truck

- from 6 story lofts to single story Sheds

5). A "Flat" Industrial Rent Gradient?

[Buttimer and Rutherford]

With a "flat" rent gradient: Industries move to the edge
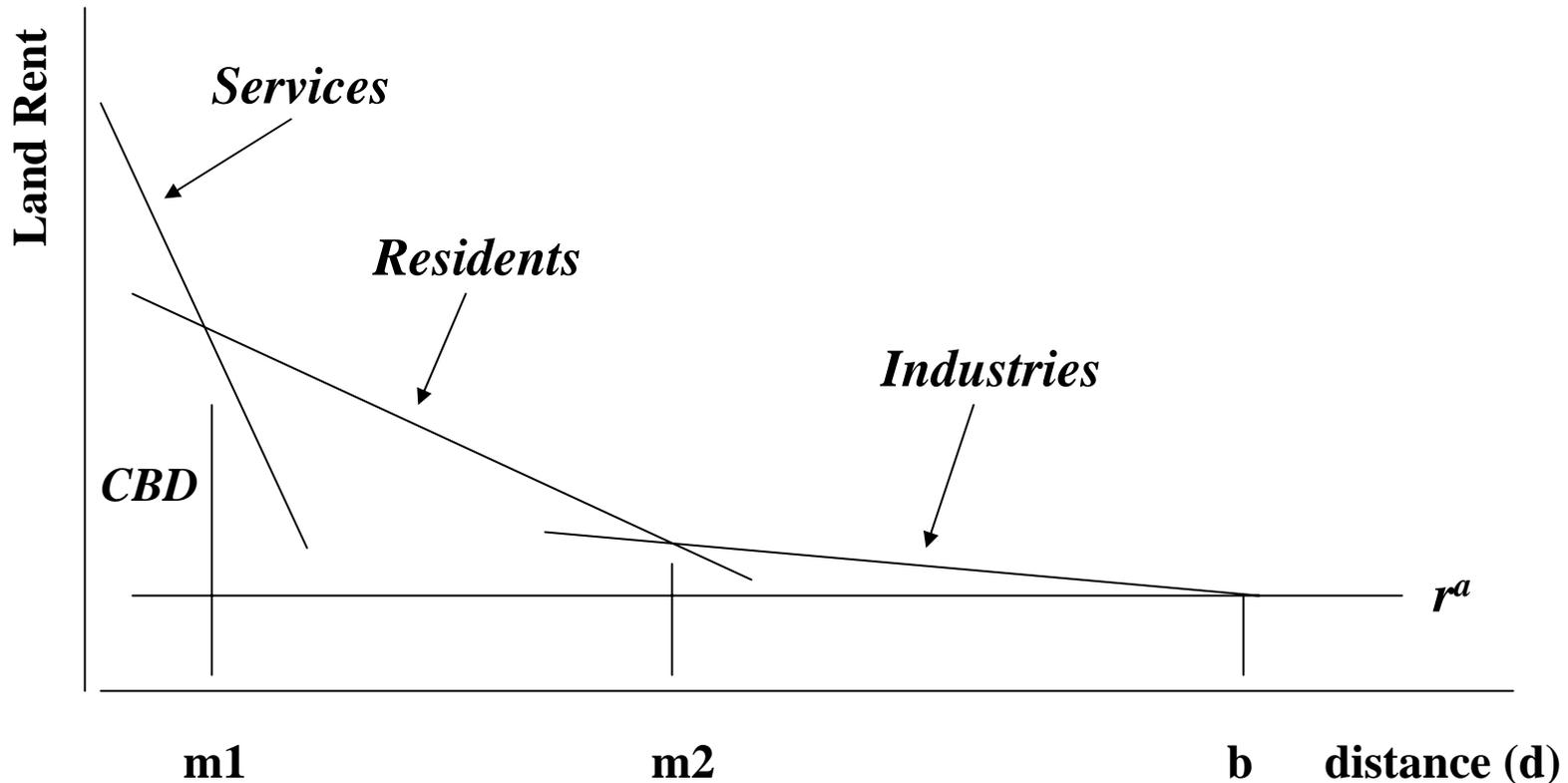
Chicago Industrial rents on 6000 properties related to the distance of the property to Chicago's CBD
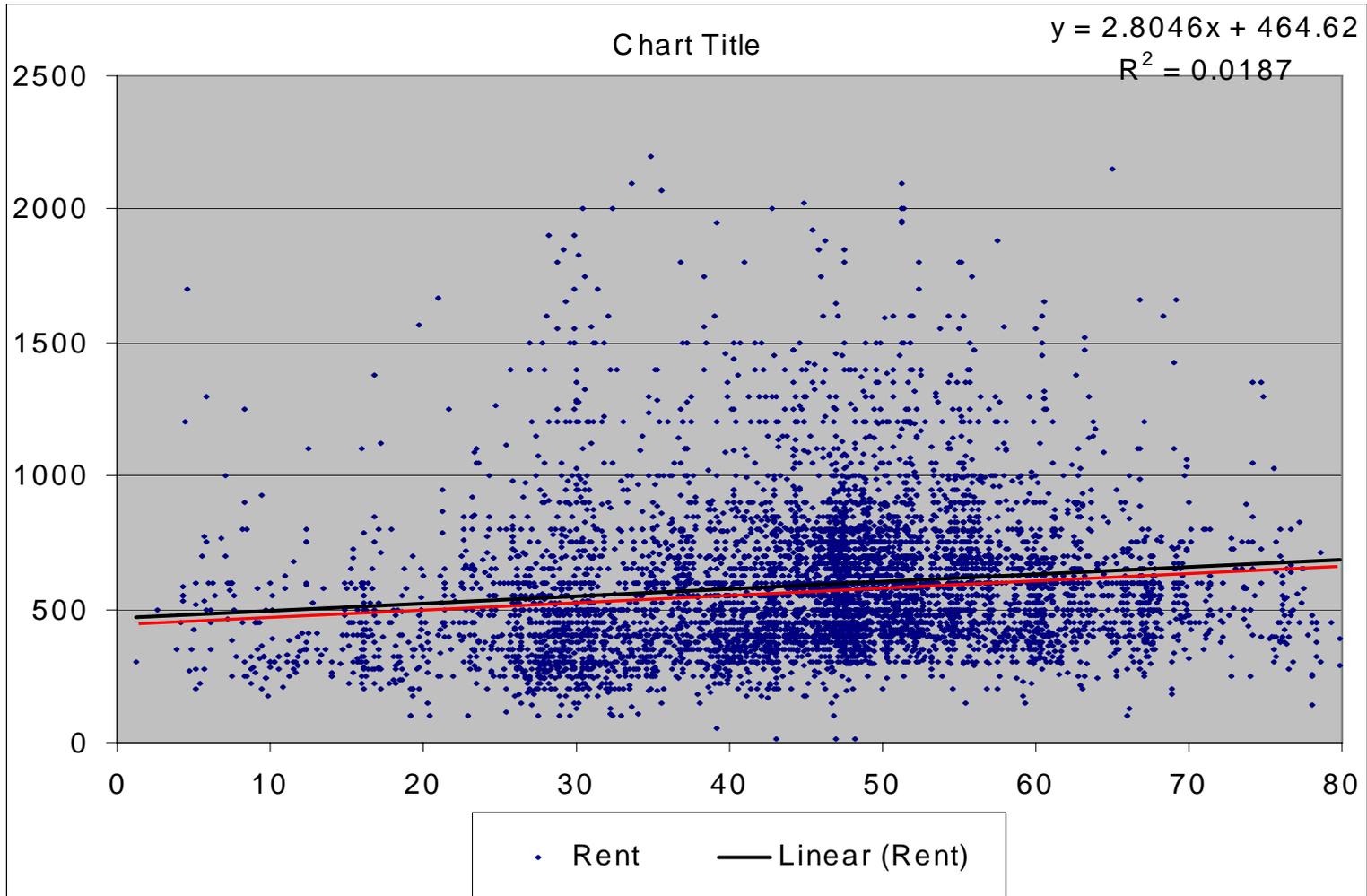
Modern Industrial Location

Why do industries locate:

- Next to Highways

- Next to Airports or seaports

- On land that is recycled, wet, or marginal

But also:

- In areas already developed.

- Near to population?

[Shukla-Waddell, Struyk-James]

If residential rents look like this – then where do industrial properties locate?
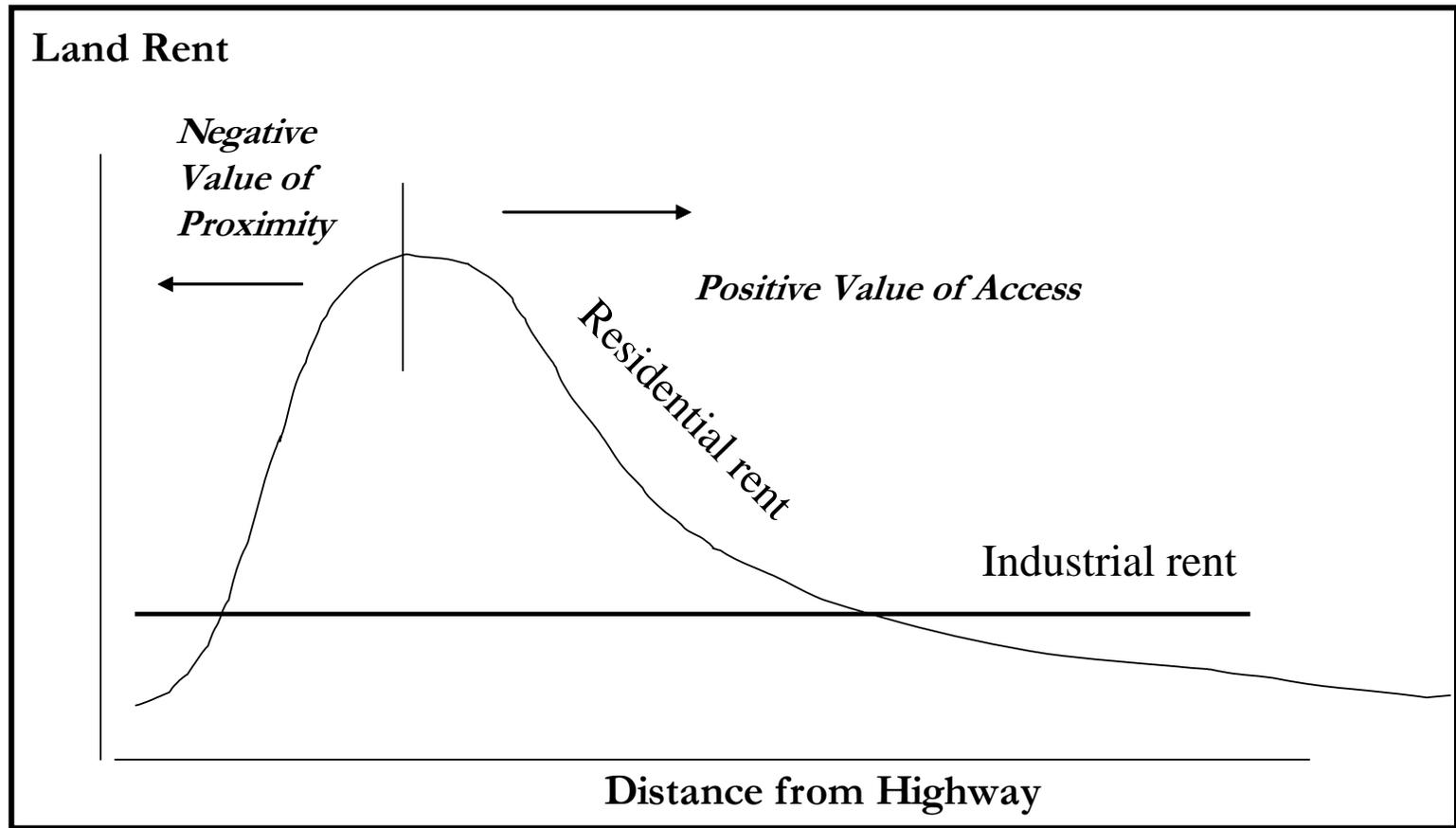
Urban Land Residuals: Residential, Office, Industrial use

Location	Residual Component			
	F	*P*	*C*	*p*
Industrial	.40	45	30	6.0
Office (mid rise)	3.0	250	200	150.0
Town House	1.5	200	175	37.0
SF Housing	.35	250	150	35.0

Sales data from the Internet, Costs from RS Means, 2003.